

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striketrough~~. When striketrough cannot easily be perceived, [[double brackets]] are used to show the deletion. The status of each claim is indicated with one of (ORIGINAL), (CURRENTLY AMENDED), (CANCELLED), (WITHDRAWN), (NEW), (PREVIOUSLY PRESENTED), OR (NOT ENTERED).

Please AMEND claims 1 and 3 and ADD new claims 5 – 19 in accordance with the following:

1. (CURRENTLY AMENDED) A spot welding system for performing spot welding operations using a spot welding gun having a servomotor for driving welding tips to apply a pressing force on objects of welding, comprising:

a temperature sensor arranged at a suitable position for detecting a temperature of the servomotor ~~or~~and movable components of the spot welding gun; and

a controller for controlling the servomotor such that the welding tips apply a predetermined pressing force on the objects of welding based on the temperature detected by said temperature sensor.

2. (ORIGINAL) A spot welding system according to claim 1, wherein said controller compensates a commanded pressing force using a relation between variation of the temperature and variation of the pressing force.

3. (CURRENTLY AMENDED) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations, comprising:

detecting a temperature of the servomotor ~~or~~and movable components of the spot welding gun; and

controlling the servomotor such that the welding tips apply a predetermined pressing force to the object of welding based on the detected temperature.

4. (ORIGINAL) A method of controlling a pressing force of a spot welding gun according to claim 3, wherein said controlling of the servomotor includes compensating a commanded pressing force using a relation between variation of the temperature and variation of the pressing force.

5. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations, comprising:

determining a temperature of the servomotor and movable components of the spot welding gun;

calculating a pressing force compensating amount taking into account the temperature and the pressing force; and

controlling the servomotor such that the welding tips apply a predetermined pressing force to the object of welding based on the determined temperature.

6. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, further comprising:

determining whether or not a control changeover signal has been issued to the servomotor, and if so,

reading a pressing force command;

compensating the pressing force command; and

calculating a torque command for pressing force control.

7. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, wherein said calculating pressing force compensating amount

taking into account temperature and the pressing force uses an equation of form: $\alpha = A \times (T - T_0)$.

8. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, further comprising estimating a disturbance torque using a disturbance torque observer built in a servo CPU.

9. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 18, wherein said calculating a torque command for position control uses an equation of form: $\tau = K_1 \times (r - y)$.

10. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 6, wherein said compensating the pressing force command uses an equation of form: $p' = p - \alpha$.

11. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 6, wherein said calculating a torque command for pressing force control uses an equation of form: $\tau = K_2 \times (p' - d)$.

12. (NEW) A spot welding system according to claim 1, further comprising a water-cooled system for the servomotor, distal ends of arms, and the welding tips of the spot welding gun.

13. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding

operations according to claim 5, wherein said calculating a pressing force compensating amount taking into account the temperature and the pressing force uses a linear function, a quadratic function, or a higher order function.

14. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, further comprising storing the pressing force compensating amount in a table.

15. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, further comprising reading the pressing force compensating amount from a table.

16. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, further comprising cooling the servomotor, distal ends of arms, and the welding tips of the spot welding gun with a water-cooled system.

17. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, further comprising determining a relation between variation of the temperature and variation of the pressing force using experimentation.

18. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 5, further comprising:

determining whether or not a control changeover signal has been issued to the servomotor, and if not,

calculating a torque command for position control.

19. (NEW) A method of controlling a pressing force applied on objects of welding from welding tips driven by a servomotor of a spot welding gun for performing spot welding operations according to claim 8, wherein said estimating disturbance torque is derived from a torque command and position feedback amount sent from a position detector.